



Experiment

Effectiveness of Conditioning Program on Cardio-respiratory Fitness and Self-concept of Obese Adolescent Male

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ABSTRACT

Obesity is a worldwide epidemic, with prevalence rates doubling over the last 15-20 years, and India has the second highest number of obese children in the world, with 14.4 million. Considering the importance of obesity, the problem has been stated as – the ‘Effect of conditioning program on cardiorespiratory fitness and self-concept of obese Adolescent males.’ The main objective of this study was- to observe the effect of 12 weekly conditioning training programs on Cardio-respiratory fitness and Self-concept of obese Adolescent males. A total of 40 obese adolescent males were selected, and their ages ranged between 15 to 17 years. The 12-minute Cooper test and standardized six-dimensional self-concept questionnaire of Prof Raj Kumar Saraswat were considered criterion measures. The BMI was used to classify the subjects into two equal groups (i.e.-Con-1 and Exe-1), pair sample designing was developed, and the initial information was collected; then 12-week conditioning program was given to the Experimental group. After 12 weeks of training, the post-test information was collected from both the Control and Experimental group, and the descriptive statistical procedure ANCOVA method was applied to get better results. The following conclusions were drawn –This study showed a significant effect on cardio-respiratory fitness and Self-concept of Obese adolescent males.

INTRODUCTION:

India has the second highest number of obese children globally, with 14.4 million reported cases, according to a new study published in The New England Journal of Medicine (1). China, with 15.3 million obese children, tops the list. The incidence of obesity has doubled since 1980 in over 70 countries, the research finds(1).

Even though obesity among children was lower than among adults, childhood obesity has grown faster than adult obesity in many countries. In 2015, over 2 billion children and adults worldwide were overweight. Of these, nearly 108 million children and more than 600 million adults had a body mass index (BMI) above 30, which is the threshold for obesity. Globally, the prevalence of

childhood obesity has risen in recent years. The International Association for the Study of Obesity (IASO) and the International Obesity Task Force (IOTF) estimate that 200 million school children are either overweight or obese(2).

It is well known that being overweight is one of the first health problems leading to obesity. Many data indicate that being overweight and obese are among modern society's most common and severe health problems (3). According to the World Health Organization (4) data, about 1.6 billion overweight adults have a body mass index (BMI) above 25 kg/m². At least 400 million are obese, with a BMI above 30 kg/m². Body fat percentage and BMI are among the factors responsible for reduced

physical fitness, as confirmed by research conducted on young populations (5,6,7).

Various literature data emphasize that regular exercise is a valuable tool in easing the global burden of chronic diseases, including those associated with being overweight and obese (8-11).

Cardio-respiratory endurance measures how well the heart, lungs, and muscles perform during moderate to high-intensity physical activity. Getting regular physical activity, especially aerobic exercise, can improve cardio-respiratory endurance. Aerobic exercises can help promote heart and lung health and improve how well the body circulates and utilizes oxygen.

Self-Concept is composed of such elements such as the perceptions of one's characteristics and abilities, the percepts and concepts of the self in relation to others and to the environment, the value qualities perceived as associated with experiences and objects, and the goals and ideals perceived as having a positive or negative balance.

Saraswat and Gaur (1981) describe the self-concept as the individual's view of looking at himself. It also signifies their way of thinking, feeling, and behaving. Adolescence is a period of life with its peculiar characteristics and problems.

The relationship between self-concept and how others perceive the individual can trigger a series of behaviors that range from loneliness to frustration. The obese youngster considers excess weight undesirable, conceptualizing his body as shameful and inferior to other young people (12). These feelings, in turn, may lead to depressive disorders, problems with personal relationships, and consequent isolation, which are closely related to the maintenance or progression of obesity (13). In this respect, one study investigated the impact of the trajectory of obesity during adolescence on mental health parameters. In that study, boys who were not obese at 11 years but who became obese at 15 years presented a higher score of personal relationship problems than the non-obese group at 11 and 15 years (14). Another study demonstrated the negative impact of obesity on depression and anxiety. In that study, more than 60,000 subjects from 13 cross-sectional surveys conducted in different countries were investigated. A significant association between obesity and mental health was observed for pooled data across countries; however, individual data analysis only showed a significant association in some countries (15). Based on the available literature review and the keen interests of the researcher, the problem was stated as- the "EFFECT OF CONDITIONING PROGRAM ON CARDIO-RESPIRATORY FITNESS AND SELF-CONCEPT OF OBESE ADOLESCENT MALE."

PURPOSE OF THE STUDY:

The primary purpose of the study were-

I. To evaluate the Cardio-respiratory fitness and self-concept of Adolescent obese boys. II. To evaluate the impact of 12 weekly conditioning programs on cardio-respiratory fitness of Adolescent obese boys. III. To evaluate the impact of 12 weekly conditioning programs on the Self-concept of Adolescent obese boys.

DELIMITATION & LIMITATION:

The study was delimited in the following areas: only Age, Height, Weight, BMI, and WHR were adopted as personal data of Adolescent Obese boys. The duration of the training program was only 12 weeks. Only 40 obese adolescent boys were considered as subjects of this study. Among these, 20 were the Control group, and 20 were the Experimental group. The 12-minute walk/run Cooper test was taken for cardio-respiratory fitness. Only a six-dimensional Self-concept questionnaire of Prof. Raj Kumar Saraswat was taken to measure the self-concept of Adolescent Obese boys. The study has been confined to the following limitations- the analysis was restricted within the greater Calcutta area. The subjects were day scholars, so their daily activities could not be controlled. The food habits of the subjects are also a limiting factor in this study.

HYPOTHESIS:

H₀ 1: There will be no significant changes due to the conditioning program on the BMI of Adolescent Obese boys.

H₀ 2: There will be no significant changes due to the conditioning program on Cardio-respiratory fitness of Adolescent Obese boys.

H₀ 3: No significant changes will occur due to the conditioning program on the Self-concept of Adolescent Obese boys.

METHODOLOGY**THE SUBJECT:**

Forty adolescent obese boys were selected from Health & Wellness awareness program for overweight and obesity prevention camp, Baranagar Ramkrishna Mission, Kolkata, as subjects of this present study, and the age of the issues ranged between 15 to 17 years. All the subjects resided in their own house.

EXPERIMENTAL DESIGN:

In this present study pair sampling design was used. Groups were made equivalent based on BMI values. There were two equal-sized groups. One was a control, and the other was an experimental group. While the control group was not given any treatment, the other experimental group was assigned the treatment of 12 weeks conditioning program, which was a specific exercise treatment through an adequately designed weekly schedule. The groups were tested for performance in each health-related fitness component and paper-pencil Self-concept and Wellness tests both before and after exercise treatment.

EXERCISE TREATMENT:

The experimental group was given exercise treatments. The duration of the conditioning training program was 12 weeks. The treatment was given three days each week. The duration of each training session was 90 minutes. Fifteen minutes for warming up, 15 minutes for cooling down, and 60 minutes for the main treatment part. The conditioning program consisted of two forms: one aerobic exercise intervention and another health and wellness awareness program.

CRITERION MEASURE:

For this study, height and weight were taken for BMI, and 12-minute walk and run Cooper test were taken for cardio-respiratory fitness, and a standardized questionnaire of Prof. Raj Kumar Saraswat was taken for the Self-concept of adolescent obese boys.

STATISTICAL PROCEDURE:

Standard statistical techniques were used to get a definite conclusion after collecting the data. Mean, SD and ANCOVA were used in this study.

RESULT & DISCUSSION

The Mean and SD values of the Control and Experimental groups of Adolescent Obese Boys in BMI were presented in Table no-1.

Table-1
The Mean and SD values of Control and Experimental groups in Age, Height, and Weight

GROUPS	AGE(YEAR)		HEIGHT(METER)		WEIGHT(KG)	
	MEAN	SD (±)	MEAN	SD (±)	MEAN	SD (±)
CONTROL	16.4	1.14	1.65	0.03	85.7	3.93
EXPERIMENTAL	16.3	1.21	1.64	0.03	85.56	4.07

Table no-1 showed that the mean and SD values of age, height, and weight of control and experimental groups were more or less similar because subjects of this study were taken through pair sampling designing.

4.2 The Mean and SD values of Control and Experimental groups of Adolescent Obese Boys in BMI were presented in Table no-2.

Table-2
The Mean and SD values of the Pre-test and Post-test of Control and Experimental groups in BMI

BMI (Kg/Mt ²)	PRE-TEST		POST-TEST		F-Value
	MEAN	SD (±)	MEAN	SD (±)	20.89
CONTROL	31.55	1.18	32.02	1.10	
EXPERIMENTAL	31.56	1.12	30.22	1.16	

It appears from Table no-2 that the mean values of the pre-test and post-test of the Control group in BMI were 31.55 and 32.02, with variations of 1.18 and 1.10, respectively. Similarly, the mean values of the pre-test and post-test of the Experimental group in BMI were 31.56 and 30.22, with variations of 1.12 and 1.16, respectively.

Comparing the mean values, it was also found that the mean values of the pre-test and post-test of the experimental and control groups in BMI were different. ANCOVA was computed to observe the difference among the groups, and the value was found to be 20.22, which was significant at 0.05 levels. However, to ascertain the degree of differences between the pre-test and post-test of control and experimental groups in BMI, the paired sample 't'-test was computed, and the values were presented in Table no-3.

Table No-3
Difference between Pre-test and Post-test of Control and Experimental groups in BMI

MEAN DIFFERENCE BETWEEN THE GROUPS IN BMI		PAIRED SAMPLE MEAN DIFFERENCES					‘t’ Test	Sig. (2- tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference			
					Lower	Upper		
Pair 1	CONTROL PRE- TEST VS CONTROL POST- TEST	.06766	.28445	.06361	.20079	.06547	1.064	.301
Pair 2	CONTROL PRE- TEST VS EXPERIMENTAL PRE-TEST	.002	1.55	.34632	.72291	.72681	.006	.996
Pair 3	EXPERIMENTAL PRETEST VS EXPERIMENTAL POST-TEST	1.37	.27	.060	1.24	1.49	22.70	.000
Pair 4	CONTROL POST- TEST VS EXPERIMENTAL POST-TEST	1.44	1.42	.32	.77	2.10	4.53	.000

From Table no-3, it was clear that a significant difference exists between the experimental pre-test and experimental post-test & control post-test, and experimental post-test in BMI. However, no significant difference exists between the control pre-test, control post-test & control pre-test, and experimental pre-test.

4.3 The Mean and SD values of Control and Experimental groups of Adolescent Obese Boys in Cardio-respiratory fitness were presented in Table no-4.

Table No-4
The Mean and SD values of the Pre-test and Post-test of Control and Experimental groups in Cardio-Respiratory Fitness

CARDIO-RESPIRATORY FITNESS	PRE-TEST		POST-TEST		F-VALUE
	MEAN	SD ($\pm$)	MEAN	SD ($\pm$)	
CONTROL	19.68	3.96	20.02	3.94	55.54
EXPERIMENTAL	19.43	3.39	26.65	5.26	

It appears from Table no-4 that the mean values of the pre-test and post-test of the Control group in Cardio-Respiratory Fitness were 19.68 and 20.02, with variations of 3.96 and 3.94, respectively. Similarly, the mean values of the pre-test and post-test of the Experimental group in Cardio-Respiratory Fitness were 19.43 and 26.65, with variations of 3.39 and 5.26, respectively.

Comparing the mean values, it was also found that the mean values of the pre-test and post-test of the experimental and control groups in Cardio-respiratory fitness were different. ANCOVA was computed to observe the difference among the groups, and the value was found to be 55.24, which was significant at 0.05 levels. However, to ascertain the degree of differences between the pre-test and post-test of control and experimental groups in Cardio-Respiratory fitness, the paired sample 't'-test was computed, and the values were presented in Table no-5.

MEAN DIFFERENCE BETWEEN THE GROUPS IN CARDIO- RESPIRATORY FITNESS		PAIRED SAMPLE MEAN DIFFERENCES					Sig. (2- tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference			t' Test
					Lower	Upper		
Pair 1	CONTROL PRE-TEST VS CONTROL POST- TEST	.073	.48	.11	.297	.15	.67	.51
Pair 2	CONTROL PRE-TEST VS EXPERIMENTAL PRE-TEST	.81	5.57	1.25	1.80	3.41	.65	.52
Pair 3	EXPERIMENTAL PRETEST VS EXPERIMENTAL POST-TEST	7.22	4.01	.89	9.09	5.34	8.05	.00
Pair 4	CONTROL POST- TEST VS EXPERIMENTAL POST-TEST	6.82	6.62	1.49	9.92	3.72	4.60	.00

From Table no-5, it was clear that a significant difference exists between the experimental pre-test and experimental post-test & control post-test, and experimental post-test in Cardio-respiratory fitness. However, no significant difference exists between the control pre-test, control post-test & control pre-test, and experimental pre-test.

4.4 The Mean and SD values of Control and Experimental groups of Adolescent Obese Boys in Self-concept were presented in Table no-6.

Table No-6

The Mean and SD values of the Pre-test and Post-test of Control and Experimental groups in Self-Concept

SELF-CONCEPT (IN SCORE)			PHYSICAL	MENTAL	SOCIAL	EDUCATIONAL	TEMPERAMENTAL	INTELLECTUAL	SELF-CONCEPT	F-RATIO
CONTROL	PRE-TEST	MEAN	23.25	24.3	29.7	26.2	23.85	23.5	151.15	88.89 Sig. at 0.05 Levels
		SD ($\pm$)	3.23	2.74	2.94	4.24	3.57	2.65	8.83	
	POST-TEST	MEAN	25	25.5	30.6	27.5	25.3	25.35	159.25	
		SD ($\pm$)	2.58	2.21	2.37	3.63	2.89	2.13	5.19	
EXPERIMENTAL	PRE-TEST	MEAN	23.65	23.05	30.2	25.75	25.15	24.15	151.95	
		SD ($\pm$)	3.12	2.44	1.45	3.40	3.40	3.10	8.65	
	POST-TEST	MEAN	28.95	28.5	32.2	29.7	29.05	28.85	177.35	
		SD ($\pm$)	2.50	1.76	1.44	2.31	2.74	2.56	5.98	

It appears from Table no-6 that the mean values of the pre-test and post-test of the Control group in Self-concept were 151.15 and 159.25, with variations of 8.83 and 5.19, respectively. Similarly, the mean values of the pre-test and post-test of the Experimental group in Self-concept were 151.95 and 177.35, with variations of 8.65 and 5.98, respectively. Comparing the mean values, it was also found that the mean values of the pre-test and post-test of the experimental and control groups in Self-concept were different to observe the difference among the groups, ANCOVA was computed, and the value was found to be 88.89, which was significant at 0.05 levels. However, to ascertain the degree of differences between the pre-test and post-test of control and experimental groups in Self-concept, the paired sample 't'-test was computed, and the values were presented in Table no-7.

Table No-7

MEAN DIFFERENCE BETWEEN THE GROUPS IN SELF-CONCEPT		PAIRED SAMPLE MEAN DIFFERENCES					t' Test	Sig. (2-tailed)
		Mean	SD	Std. Error Mean	95% Confidence Interval of the Difference			
					Lower	Upper		
Pair 1	CONTROL PRE-TEST VS CONTROL POST- TEST	1.15	11.20	2.50	4.09	6.39	.46	.65
Pair 2	CONTROL PRE-TEST VS EXPERIMENTAL PRE-TEST	.80	3.07	.69	2.24	.64	1.17	.25
Pair 3	EXPERIMENTAL PRETEST VS EXPERIMENTAL POST-TEST	25.00	3.93	.88	26.84	23.16	28.42	.000
Pair 4	CONTROL POST- TEST VS EXPERIMENTAL POST-TEST	23.05	9.33	2.09	27.41	18.68	11.05	.000

From Table no-7, it was clear that a significant difference exists between the experimental pre-test and experimental post-test & control post-test, and experimental post-test in Self-concept. However, no significant difference exists between the control pre-test, control post-test & control pre-test, and experimental pre-test.

DISCUSSION:

This study aimed to investigate the effect of 12 weekly training programs on Cardio-respiratory fitness and Self-concept of obese adolescent boys. The present investigation showed that the conditioning training program resulted in a significant reduction in body mass, and a similar result was also found by Hesketh K., Wake M., and Waters E. in 2004. In addition, our results showed the beneficial effects of training programs on improving self-concept in obese adolescents. Our results are consistent with those of previous studies of French S.A., Story M. & Perry C.L., 1995 and Wang F.F. and Veugelers P.J., 2008. Those latter indicated a proportionally inverse relationship between body weight and adolescent self-esteem.

This study also evoked that the 12 weeks conditioning program has significantly increased the cardio-respiratory fitness of obese adolescent boys. The training program also decreased the body weight and BMI over time and showed relative effect between groups. Most previous studies suggested that aerobic exercise (5 times for 12 weeks at 40%–70% maximal oxygen uptake), high intensity combined exercise (5 times for three weeks) could down-regulate body weight, % body fat, and BMI of obese people when compared to the non-exercise group (Avkin & Aslan, 2017).

‘The 12-week conditioning program significantly improved cardio-respiratory fitness and self-concept compared to the non-exercise group. In previous studies on cardio-respiratory endurance, combined exercise for 12 weeks or high-intensity circuit training for eight weeks increased cardio-respiratory endurance and muscle endurance in middle-aged obese women (Smith-Ryan et al., 2016). Also, Myers et al. (2015) suggested that physical activity increased the flexibility and cardiopulmonary fitness of obese women and that cardiopulmonary endurance was improved in severely obese women as a result of a swimming exercise program three times a week for 12 weeks (Lee & Oh, 2014; Rolland et al., 2004).

CONCLUSION:

Based on the study's limitations, the following conclusions were drawn- I. Due to conditioning program effects, a significant difference was observed in the BMI of the Experimental group, but no significant differences were observed between the pre-test and post-test of the control groups. II. The 12 weeks Conditioning program was found to be good in improving the performance of the Experimental group in Cardio-respiratory fitness, but no significant differences were observed between the pre-test and post-test of the control groups. III. The 12 weeks Conditioning program was found to be good in improving the performance of the Experimental group in Self-concept, but no significant differences were observed between the pre-test and post-test of the control groups.

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